

**SYSTEM AND METHOD FOR PROCESSING
MEMORY INSTRUCTIONS**

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Abstract

A novel system and method for processing memory instructions. One embodiment of the invention provides a method for processing a memory instruction. In this embodiment, the method includes obtaining a memory instruction, obtaining one or more memory address operands, creating a virtual memory address using the one or more memory address operands, translating the virtual memory address into a physical memory address, and executing the memory instruction on a cache controller, wherein the cache controller uses the memory instruction and the physical memory address to determine whether to access a portion of a local or a remote cache. In some embodiments, the obtaining of the memory instruction includes obtaining a memory instruction selected from a group consisting of a scalar load instruction, a scalar store instruction, a prefetch instruction, a synchronization instruction, and an atomic memory operation (AMO) instruction.

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